AN
ACCOUNT
OF THE
PRINCIPLE and EFFECTS
OF THE
AIR STOVE-GRATES,

(Which warm Rooms, &c. by a continual Introduction and Exchange of dry freſh Air,)
Commonly known by the Name of AMERICAN STOVES:

TOGETHER WITH A
DESCRIPTION
OF THE LATE
ADDITIONS and IMPROVEMENTS
MADE TO THEM

By JAMES SHARP,
(For which his Majeſty's PATENTS for *Great-Britain* are obtained,)
No. 15, LEADENHALL-STREET, LONDON.

Either warm or cold Air may (by this Improvement) be drawn through the Stove ſo as to raiſe or lower the Thermometer at Pleaſure: And, it is found by Experience, if a Room be made ever ſo warm it will ſtill be freſh Air, perfectly free from Smell, and agreeable to the niceſt Breath and tendereſt Lungs.

N.B. The Manufactory is at No. 133, TOOLEY-STREET, SOUTHWARK.

THE TENTH EDITION.

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BRITISH MUSEUM

An Account of the Principle and Effects of the *AIR* Stove-Grates, (which warm Rooms, *&c.* by a continual Introduction and Exchange of dry freſh Air,) commonly known by the Name of *American* Stoves; together with ſome late Improvements made to them by JAMES SHARP, for which his Majeſty's Patent has been obtained.

THE Principle, upon which theſe Stoves act, is deſcribed by the Sieur *Gauger*, in his Book, intitled "*Méchanique de Feu,*" publiſhed in 1709; the firſt Patterns in caſt Iron upon this Principle were the Invention of the celebrated and ingenious Dr. *Benjamin Franklin,* who then reſided in *Philadelphia*, on which Account they obtained the Name of *American* Stoves. Dr. *Franklin* ſpeaks of the Invention in his *Letters on Philoſophical Subjects*, (Page 300,) as follows: "In which" (ſays he) "there are hollow Cavities made by Iron Plates in the Back, Jambs, and Hearths; through which Plates the Heat paſſing warms *the Air* in thoſe Cavities, *which is continually coming into the Room* FRESH *and* WARM. The Invention was very ingenious, and had many Conveniences: The Room was warmed in all Parts by the Air flowing into it through the heated Cavities; cold Air was prevented ruſhing through the Crevices, the Funnel being ſufficiently ſupplied by thoſe Cavities; much leſs Fuel would ſerve, *&c.* But the firſt Expence, which was very great, the Intricacy of the Deſign, and the Difficulty of the Execution, eſpecially in old Chimneys, diſcouraged the Propagation of the Invention."

Theſe Difficulties were in a great Meaſure removed by Dr. *Franklin*'s Improvements: the Uſe of them became more common; and the Principle was adopted in various different Ways, where Chimneys could be found large enough to receive them; and where Communications could be conveniently made to procure a ſufficient Quantity of freſh Air for their Supply. But ſtill the Expence and Trouble of fixing them in Brickwork, and the great Delays and Difficulty of making Workmen underſtand the Manner of fixing them, remained, and have hitherto prevented their general Uſe.

But, by the Additions now made to the Conſtruction, theſe Difficulties are removed; and (where Communication can be had with the external Air) they are eaſily applied to any Rooms whatever; either thoſe which have, or thoſe which have not, Chimneys; ſo that not only ſmall Rooms, but the largeſt Halls, Libraries, or Churches, may be warmed in a more effectual Manner than has ever before been done; the greateſt Quantity of Heat being produced from any given Quantity of Fuel that can be ſuppoſed; for theſe Stoves are effectual on every Principle by which Rooms can be warmed.

Firſt, it ſhews a handſome Fire, ("which is in itſelf a pleaſant Thing,") by which the Rays of Heat are thrown out, and the full Effect of open Fires obtained, in Proportion to the Size of the Stove.

2dly, It may be detached from the Wall or Chimney, and the Air may have free Liberty to paſs round it, whereby every Advantage of the *Holland*, or *German*, Stove is produced.

3dly, The Funnel, or Chimney, is contracted ſo that no ſuperfluous Air is carried off; little Fuel ſerves, the Heat being almoſt all ſaved; and

4thly, The Room is ſupplied by this Stove with external or freſh Air, rarified as it enters, to a Summer Warmth; and this in ſo great a Quantity, that, inſtead of cold Air ruſhing in at every Crevice, it will actually force itſelf out at Key-Holes and Chinks; whereby, it is evident, a greater Exchange and better Supply of freſh Air is procured than can be obtained by any other Method of warming yet diſcovered. And,

5thly, If the Room be at any Time found too warm, there are proper Shutters to prevent the Entrance of the warm rarified Air, and others which may be opened to let in the cold Air, by ſuch commodious Channels, that the too great Warmth may be gradually exchanged, and cooled, without being liable, like the Opening of Doors or Windows, to give Cold to thoſe who ſit in the Room.

Thus, the *American* Stove will enable the Uſer to render a Room either *warm*, *temperate*, or *cool*, at his Pleaſure, by the eaſy and commodious Means of introducing a free Current of either warm or cold Air, as it may alternately be wanted, through thoſe different Channels: Or, if the Effect of a common Grate ſhould at any Time be thought more deſirable, the Stopping of theſe Channels will produce that Effect, as the *American* Stoves ſhew the Fire contained in them to as much Advantage, in Proportion to their reſpective Sizes, as any other common Grates.

The Advantages of this Fire-Place.

“ Its Advantages above the common Fire-Places are,

“ 1. That your whole Room is equally warmed, ſo that People need not croud ſo cloſe round the Fire, but may ſit near the Window, and have the Benefit of the Light for Reading, Writing, Needle-work, *&c.* They may ſit with Comfort in any Part of the Room, which is a very conſiderable Advantage in a large Family;” or (it may be added) in Boarding-Schools, where all cannot conveniently be permitted to come near the Fire, whereby the woful Effects of Chilblains upon the poor Children too often prove the Conſequence.

“ 2. If you ſit near the Fire, you have not that cold Draught of uncomfortable Air nipping your Back and Heels, as when before common Fires, by which many catch Cold, being ſcorched before, and, as it were, frozen behind.

“ 3. If you ſit againſt a Crevice, there is not that ſharp Draught of cold Air playing on you, as in Rooms where there are Fires in the common Way, by which many catch Cold; whence proceed Coughs, Catarrhs, Tooth-Achs, Fevers, Pleuriſies, and many other Diſeaſes.

"4. In Caſe of Sickneſs, they make moſt excellent Nurſing-Rooms, as they conſtantly ſupply a Sufficiency of freſh Air, ſo warmed at the ſame Time as to be no Ways inconvenient or dangerous. The equal Temper, too, and Warmth of the Air of the Room are thought to be particularly advantageous in ſome Diſtempers; for it was obſerved, in the Winters of 1730 and 1736, when the Small-Pox ſpread in *Penſilvania*, that very few Children of the Germans died of that Diſtemper in Proportion to thoſe of the Engliſh; which was aſcribed by ſome to the Warmth and equal Temper of the Air in their Stove-Rooms; which made the Diſeaſe as favourable as it commonly is in the *Weſt Indies*. But this Conjecture we ſubmit to the Judgement of Phyſicians.

"5. In common Chimneys, the ſtrongeſt Heat from the Fire, which is upwards, goes directly up the Chimney, and is loſt; and there is ſuch a ſtrong Draught into the Chimney, that not only the upright Heat, but alſo the Back, Sides, and downward Heats, are carried up the Chimney, by that Draught of Air, and the Warmth, given before the Fire by the Rays that ſtrike out towards the Room, is continually driven back, crouded into the Chimney, and carried up by the ſame Draught of Air; but here the upright Heat ſtrikes and heats the Top Plate, which warms the Air above it, and that comes into the Room. The Heat likewiſe, which the Fire communicates to the Sides, Back, Bottom, and Air Box, is all brought into the Room; for you will find a conſtant Current of warm Air coming out of the Chimney-Corner into the Room. Hold a Candle juſt under the Mantle-Piece, or Breaſt, of your Chimney, and you will ſee the Flame bent outwards. By laying a Piece of ſmoking Paper on the Hearth, on either Side, you may ſee how the Current of Air moves, and where it tends, for it will turn and carry the Smoke with it.

"6. Thus, as very little of the Heat is loſt, when this Fire-Place is uſed much leſs Wood or Fuel will ſerve you, which is a conſiderable Advantage where Wood is dear.

"People, who have uſed theſe Fire-Places, differ much in their Accounts of the Wood ſaved by them, ſome ſay five-ſixths, others three-fourths, and others much leſs. This is owing to the great Difference there was in their former Fires; ſome (according to the different Circumſtances of their Rooms and Chimneys) having been uſed to make very large, others middling, and others of a more ſparing Temper very ſmall ones; while in theſe Fire-Places (their Size and Draught being nearly the ſame) the Conſumption is more equal; I ſuppoſe, taking a Number of Families together, that two-thirds or half the Wood, at leaſt, is ſaved. My common Room, I know, is made twice as warm as it uſed to be with a Quarter the Wood I formerly conſumed there."

If what Dr. *Franklin* mentions here be true, the Saving is great indeed; and, that the Fact is ſo, I have no kind of Doubt; for I have uſed *American* Stoves in ſeveral Rooms in my Houſe for many Years with great Advantage; my Dining-Room, in particular, which has a large old-faſhioned Chimney, was formerly ſo cold as to be diſuſed by my Predeceſſors in cold Weather; for the largeſt Fires that could be made did not warm it: but, ſince the ſame Room has had an *American* Stove, (which is near Twenty Years,) it has been as comfortable with Reſpect to Warmth as any Room can be made; and, with Reſpect to the Saving of Fuel, it is impoſſible for me to ſay exactly how great the ſaving has been; but, I can with great Truth aſſert, it has been many Times more than the original Coſt of the Stove.

" 7. When you burn Candles near this Fire-" Place, you will find that the Flame burns quite " upright, and does not blare and run the Tallow " down, by drawing towards the Chimney, as " againſt common Fires.

" 8. This Fire-Place cures moſt ſmoky Chim-" neys, and thereby preſerves both the Eyes and " Furniture.

" 9. It prevents the Fouling of Chimneys; much " of the Lint and Duſt, that contribute to foul " a Chimney, being by the low Arch obliged to " paſs through the Flame, where it is conſumed; " then, leſs Fuel being burnt, there is leſs Smoke " made. Again, by hanging on the Blower, a " Flame is ſoon produced, and, in Conſequence, " the ſame Fuel does not yield ſo much Smoke " as if burnt in a common Chimney; for, as ſoon as " Flame begins, Smoke in Proportion ceaſes.

" 10. And, if a Chimney ſhould be foul, it is " much leſs likely to take Fire; if it ſhould take " Fire, it is eaſily ſtifled and extinguiſhed.

" 11. A Fire may be very ſpeedily made in " this Fire-Place by the Help of the above-" mentioned Blower. With all theſe Conveni-" encies you do not loſe the pleaſing Sight nor Uſe " of the Fire."

OBJECTIONS anſwered.

" There are ſome Objections commonly made " by People that are unacquainted with theſe Fire-" Places, which it may not be amiſs to endeavour " to remove, as they ariſe from Prejudices, which " might otherwiſe obſtruct, in ſome Degree, the " general Uſe of this beneficial Machine.

" We frequently hear it ſaid, *They are of the* " *Nature of Dutch Stoves*; *Stoves have an unplea-* " *ſant Smell*; *Stoves are unwholſome*; *and warm* " *Rooms make People tender and apt to catch Cold.*"

As to the firſt, that *they are of the Nature of Dutch Stoves*, the Deſcription of theſe American Stoves already given, in the Beginning of this Paper, " ſhews that there is a moſt material Dif-" ference, and that theſe have vaſtly the Advan-

" tage, if it were only in the ſingle Article of the " Admiſſion and Circulation of the freſh Air;" for, the Dutch Stoves only warm the Air in the Room; but theſe, by the Heat of the Fire in the Room, attract ſo great a Quantity of external freſh Air, through the warming Tube or Air Box at the Back of each Stove, that the Air of the Room is continually changing, as the Current of warm freſh Wind is conſtantly ruſhing into the Room through the ſaid Air-Box, which muſt occaſion a moſt wholeſome Circulation, to carry off by it all internal Air that would otherwiſe, for Want of Change, be rendered unfit for Reſpiration.

" But, it muſt be allowed, there may have been " ſome Cauſe to complain of the *offenſive Smell* " *of Iron Stoves*; this Smell, however, never " proceeded from the Iron itſelf, which, in its " Nature, whether hot or cold, *is one of the* " *ſweeteſt of Metals*, but from the general un- " cleanly Manner of uſing thoſe Stoves. If they " are kept clean, they are as ſweet as an Ironing- " Box, which, though ever ſo hot, never offends " the Smell of the niceſt Lady: But it is com- " mon to let them be greaſed, by ſetting Candle- " ſticks on them, or, otherwiſe, to rub greaſy " Hands on them; and, above all, to ſpit upon " them to try how hot they are; which is an " inconſiderate, filthy, unmannerly, Cuſtom; for, " the ſlimy Matter of Spittle drying on, burns " and fumes when the Stove is hot, as well as the " Greaſe, and ſmells moſt nauſeouſly; which " makes ſuch cloſe Stove-Rooms, where there is " no Draught to carry off thoſe filthy Vapours, " almoſt intolerable to thoſe that are not from " their Infancy accuſtomed to them; at the ſame " Time, Nothing is more eaſy than to keep them " clean;" for when, by any Accident, they happen to be fouled, Nothing more is neceſſary, to ſcour them perfectly, than a common hard Bruſh, well applied.

" That hot Iron of itſelf gives no offenſive " Smell, thoſe know very well who have been " preſent at a Furnace when the Workmen were " pouring out the flowing Metal to caſt large " Plates, and not the leaſt Smell of it to be perceived. " That hot Iron doth not, like Lead, Braſs, and " ſome other Metals, give out unwholſome Va- " pours, is plain from the general Health and " Strength of thoſe who conſtantly work in Iron; " as Furnace-men, Forge-men, and Smiths.

" That it is in its Nature a Metal perfectly " wholeſome to the Body of Man, is known from " the beneficial Uſe of Chalybeate or Iron Mine " Waters; from the Good done by taking Steel " Filings in ſeveral Diſorders; and that even the " Smithy Water, in which hot Irons are quenched, " is found advantageous to the human Conſtitu- " tion. The ingenious and learned Dr. *Deſaguliers*, " to whoſe inſtructive Writings the Contriver of " this Machine acknowledges himſelf much in- " debted, relates an Experiment he made, to try " whether heated Iron would yield unwholſome " Vapours: He took a Cube of Iron, and, having " given it a very great Heat, he fixed it ſo to a " Receiver, exhauſted by the Air Pump, that all

“ the Air ruſhing in to fill the Receiver, ſhould firſt paſs through a Hole in the hot Iron. He then put a ſmall Bird into the Receiver, who breathed that Air without any Inconvenience, or ſuffering the leaſt Diſorder. But, the ſame Experiment being made with a Cube of hot Braſs, a Bird put into that Air died in a few Minutes. Braſs, indeed, ſtinks even when cold, and much more when hot: Lead, too, when hot, yields a very unwholſome Steam; but Iron is always ſweet, and, every Way taken, is wholeſome and friendly to the human Body, except in Weapons.

“ *That warm Rooms make People tender and apt to catch Cold* is a Miſtake as great as it is (among the Engliſh) general. We have ſeen in the preceding Pages how the common Rooms are apt to give Cold; but the Writer of this Paper muſt affirm, from his own Experience, and that of his Family and Friends who have uſed warm Rooms for theſe four Winters paſt, that, by the Uſe of ſuch Rooms, People are rendered leſs liable to take Cold, and, indeed, actually hardened. If ſitting warm in a Room made one ſubject to take Cold on going out, lying warm in Bed ſhould, by a Parity of Reaſon, produce the ſame Effect when we riſe; yet we find we can leap out of the warmeſt Bed naked, in the coldeſt Morning, without any ſuch Danger, and in the ſame Manner out of warm Clothes into a cold Bed. The Reaſon is, that in theſe Caſes the Pores all cloſe at once, the Cold is ſhut out, and the Heat within augmented, as we ſoon after feel by the glowing of the Fleſh and Skin. Thus, no one was ever known to catch Cold by the Uſe of a cold Bath; and are not cold Baths allowed to harden the Bodies of thoſe that uſe them? Are they not therefore frequently preſcribed to the tendereſt Conſtitutions? Now, every Time you go out of a warm Room into the freezing cold Air, you, as it were, plunge into a cold Bath, and the Effect is in Proportion the ſame; for, though perhaps you may feel ſomewhat chilly at firſt, you find in a little Time your Bodies hardened and ſtrengthened; your Blood is driven round with a briſker Circulation, and a comfortable, ſteady, uniform, inward Warmth, ſucceeds that equal outward Warmth you firſt received in the Room. Farther to confirm this Aſſertion, we inſtance the Swedes, the Danes, and the Ruſſians: Theſe Nations are ſaid to live in Rooms, compared to ours, as hot as Ovens; yet where are the hardy Soldiers, though bred in their boaſted cool Houſes, that can, like theſe People, bear the Fatigues of a Winter-Campaign in ſo ſevere a Climate, march whole Days up to the Neck in Snow, and at Night entrench in Ice, as they do?

“ The mentioning of thoſe Northern Nations puts me in Mind of a conſiderable public Advantage that may ariſe from the general Uſe of theſe Fire-Places. It is obſervable, that, though theſe Countries have been well inhabited for many Ages, Wood is ſtill their Fuel, and yet at no very great Price; which could

“ not have been if they had not univerſally uſed Stoves, but conſumed it as we do, in great Quantities, by open Fires. By the Help of this ſaving Invention, our Wood may grow as faſt as we conſume it, and our Poſterity may warm themſelves at a moderate Rate, without being obliged to fetch their Fuel over the *Atlantic*; as, if Pit-Coal ſhould not be here diſcovered, (which is an Uncertainty,) they muſt neceſſarily do*.

“ We leave it to the political Arithmetician to compute how much Money will be ſaved to a Country by its ſpending Two-thirds leſs of Fuel; how much Labour ſaved in Cutting and Carriage of it; how much more Land may be cleared by Cultivation; how great the Profit by the additional Quantity of Work done, in thoſe Trades particularly that do not exerciſe the Body ſo much, but that the Workfolks are obliged to run frequently to the Fire to warm themſelves: And to Phyſicians, to ſay, how much healthier thick-built Towns and Cities will be, now half ſuffocated with ſulphury Smoke, when ſo much leſs of that Smoke ſhall be made, and the Air breathed by the Inhabitants be conſequently ſo much purer.”

Now, as Flame is Nothing more than burning Smoke, and as, by leſs Fuel being burnt in the Stoves, leſs Smoke is made; and as a very great Proportion of the Smoke that is made will be conſumed in Flame; this laſt Obſervation of Dr. *Franklin* muſt certainly be a very ſtrong Argument for their general Uſe in this great Metropolis.

After the foregoing Objections fairly ſtated, and ſo ably refuted by Dr. *Franklin*, I think myſelf bound in Juſtice to mention ſuch Objections as occurred or have been mentioned to me, and have not been noticed by him; and theſe are, That they are apt to occaſion Duſt, and that ſometimes Rooms are made too hot; both which I have ſometimes found true: But, to the firſt of theſe Objections, I anſwer, it exiſted only when the Throat of the Chimney has been clogged with Soot, to which they cannot now be liable, becauſe the Funnel may eaſily be cleaned every Day if neceſſary. To the latter I anſwer, *make leſs Fire*, or open the Channel which admits cold Air; either of which is an effectual Remedy. The Flaps in the Chimney may alſo be opened, which alone would be ſufficient, if it were neceſſary.

With all the Advantages above-mentioned, it is almoſt ſurprizing that the American Stove ſhould not have been more commonly uſed; and Nothing can account for it but the Difficulty hitherto of having them properly fixed in Brick-Work; which Difficulty the Alterations now made do effectually obviate; for they may now be eaſily placed in any Chimney whatever, nay (in many Situations) better without any other Chimney than its own Iron Funnel.

Two of theſe Stoves, of a large Size, are placed in St. *John's* Church, *Southwark*, the Funnels of which are carried ſtrait up through the Galleries and Roof. They are placed oppoſite to each other, about the Middle of the Church, and the Effect is as complete as could poſſibly be deſired for the Purpoſe. A Teſtimony of this I received in a Letter from a very reſpectable Inhabitant, as follows :

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* This Tract was printed in *Philadelphia*, by Dr. *Franklin*, in 1745.

> “ I have the Pleaſure to inform you, the Stoves
> “ warmed the Church extremely well, notwith-
> “ ſtanding the many Air-Holes ; and, perhaps,
> “ you will be ſurpriſed to hear, ſeveral of the
> “ Pariſhioners have expreſſed their Fears of catch-
> “ ing Cold when they go out of the Church, *&c.*”
> “ To Mr. James Sharp, Leadenhall-Street,”
> “ *January* 26th, 1781.”

St. *John's* Church is a very elegant and large Building of Stone, and conſequently appears damp after ſevere Weather, as the Coldneſs of the Stone is apt to condenſe the Air into Water, which wets and trickles down the Walls. This ſame Effect is remarkable alſo in St. *Paul's* Cathedral, where, after cold Weather, the Water does frequently fall in large Drops, like Rain, round the Circle of the Dome ; this always happens, more or leſs, in Proportion as the external Air is warmer than the Stone and the Air in the Inſide of the Church, and in Proportion to the Quantity of the warmer Air admitted by opening the Doors, *&c.* This has been proved by opening the larger Doors, as a ſuppoſed Remedy for the Damp, but which only increaſes the Evil ; whereby it is apparent, that this Moiſture, or ſeeming Dampneſs, ariſes from the warmer Air being condenſed by the Coldneſs of the Stone, which muſt be more or leſs, in every other Stone Building, upon ſudden Changes of Weather.

In St. *John's* Church (where theſe Stoves are now placed) it has been uſual to employ Women, every *Sunday* Morning, with Cloths to wipe and dry the Pillars and Walls, before the Congregation aſſemble ; but it is now obſerved, that, after the Stove-Fires have been made a few Hours, no ſuch Damp can be found.

After ſo much has been quoted from the learned Dr. *Franklin*, in Favour of theſe Fire-Places, I may perhaps be charged with Preſumption for ſaying more about them ; but, as his Commendations apply intirely to the Sort he then uſed, I hope I may be excuſed if I add a few Words more upon the preſent Improvements.

By the Funnels, which I have added to the Top, the Stoves are rendered applicable to any Chimney, or (by Length of Funnel) to any Place without a Chimney.

By the hollow Baſe, I apply them with much greater Effect to the external Air, and without any Addition of Brick Work. And,

By the Alterations in the Air-Box, a much greater Quantity of warm Air is introduced, than could poſſibly be in their former State. Of this I have made a fair Experiment in St. *John's* Church ; for, the Air-Box of the Stove on the North-Side is exactly agreeable to Dr. *Franklin*'s Pattern ;[*] but the Air-Box of the Stove on the South-Side is ſo altered as to produce an amazing Difference of Effect ; for, the Air-Holes of the latter will act more forcibly at a Foot Diſtance than the former at Two Inches ; and, I believe, I may, with Truth, ſay that this Church is the firſt Stone Building, of its Kind and Size, that has ever been made comfortably warm by Fires.

JAMES SHARP,
Leadenhall-Street, Feb.

Many different Sizes and Patterns of theſe Stoves may be ſeen at Mr. *Sharp*'s Manufactory, N°. 133, *Tooley-Street, Southwark* ; or at his Houſe, *Leadenhall-Street, London.*

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[*] This has ſince been altered to the new Pattern.

Obſervations which have occurred ſince the above was written.

IN Rooms with very moderate Fires, the Thermometer will riſe 20 or 30 Degrees higher than in the external Air; and, with a ſmall Increaſe of Fire, may be made to ſtand, in the ſevereſt Weather, at 60 and upwards, according to Farenheit's Scale.

When the Thermometers in the open Air were at 22 Degrees, and in my Area from 25 to 30 Degrees, they continued in my Warehouſe, Parlours, and Dining-Room, at from 58 to 62 Degrees.

In a large Hall of my Brother's Houſe, 48 Feet long, 24 Feet wide, and 30 high, when the external Air was 22, or 10 Degrees below the Freezing-Point, the Thermometer in the Hall continued about 54, or ſome Degrees above temperate.

In a ſmall Room about 8 Feet ſquare, uſed by a Sailmaker as an Oven, for ſoftening Bolt-Ropes for the Navy, the Thermometer was raiſed up to 130; and the Gentlemen who made the Experiment, and were actually in the Room during that exceſſive Heat, did not perceive the leaſt Cloſeneſs or Want of Air.

In the ſame Stove I placed a Regiſter to contract the Chimney, ſuppoſing that, by ſending off a leſs Quantity of Air at the Neck of the Chimney, the Heat would be ſtronger; but it did not prove ſo; for, in Proportion as the Funnel of the Chimney was cloſed, a leſs Quantity of freſh Air was introduced through the Air-Box, and the Heat diminiſhed.

A great Quantity of Paper having been wet, by Water from the Fire-Engines, during a late dreadful Fire at an eminent Stationer's, a Propoſal was made to dry it by the warm Air, from one of theſe Stoves, fixed in a large Warehouſe prepared for that Purpoſe; the Experiment anſwered; the Effect was complete; and the Paper was dried as expeditiouſly as could be wiſhed.

A large Garden Hot-houſe for Exotics, near 100 Feet long, is warmed by one of theſe Stoves, without any other Flue or Heat whatſoever; and the Owner has ſince informed me it fully anſwers his Expectations.

Many other large Buildings have been warmed by theſe Stoves, which have met with great Approbation.

A large Meeting-houſe in *Ayliff-ſtreet, Goodman's Fields*.

The new Common-council Room, in *Guildhall, London*.

A Chapel at *Stapleburſt*, near *Cranbrook*, in *Kent*.

The new Theatre, or *Royal Circus*, in *St. George's Fields*, for Horſemanſhip, *&c*.

N. B. Theſe Stoves are reverſed from the uſual Manner of placing them, that the Light of the Fire may not frighten the Horſes as they paſs them; that is, the Fronts of the Fires are turned towards the Wall, whereby the Effect of the Rays, with Reſpect to the Warmth, is preſerved; and falſe Fronts are added to the Backs of the Stoves, which are handſome, and alſo prevent any ſcorching Heat that might affect the Riders or Horſes in ſuch ſtrong Exerciſes as they go through.

A Pariſh-church, in a Part of the Country where Coals are ſcarce and dear, is completely warmed by *one* Stove. Though the common Price of Coals in that Neighbourhood amounts to 1s. 6d. per Cwt. yet the Expence of a ſufficient Quantity of Coals, (which was carefully weighed,) together with Wood for lighting, and every other Neceſſary, included, amounts to no more than 1s. *per Sunday*.

St. *John*'s Chapel, in *Bedford-row*, near *Ormond-ſtreet*, (a very large Church, with double Galleries,) is completely warmed, in every Part, with *two Stoves*, which are placed at the Weſt End of the Church, fronting each Aile; the Smoke is carried through the Wall into Brick Chimneys, which are built on the Outſide of the Church. The Miniſter (who is alſo Proprietor of this Chapel) has expreſſed great Satisfaction at their Effect: But it muſt be confeſſed that he has carefully done his Part in the Buſineſs, by making very good double-ſcreen Doors at every Entrance, ſo that the Effect is complete.

Air, perfumed by Lavender, Roſe-leaves, or any Kind of ſweet or wholeſome Herbs; Frankincenſe, Myrrh, Amber, Gum Benjamin, Canamon, Caſſia, Cloves, or any other Kind of Spices; Camphire or Vinegar, or any Kind of Drugs that may be deſirable, either for Pleaſure or as Correctors in Caſe of Sickneſs, may be conveniently diſperſed, by putting them into Tin Pans made for that Purpoſe, and placing them in the warm-air Channels, which has the moſt agreeable Effect; for, the Funnel being incloſed with Iron Plates, none of the ſcented Air, which is uppermoſt, can run off by the Funnel, but is wholly brought into the Room, and equally diſperſed, ſo that the whole Air is impregnated thereby.

On *Sunday*, the 5th of *January* laſt, the Air was ſo warm, that the Thermometer, in the open Street, was as high as 52. A ſharp Froſt having broken up two Days before that, the Condenſement in cold Stone Buildings was generally ſo great, that the Walls ran down with Water.

In St. *Paul*'s Cathedral, the Circle round the Dome was a continual dropping Rain, and the Fog in the Church ſo great, that the Roof of the Dome could not be ſeen, though, in the open Air, it was a fine clear Day. In my Pariſh-church, the ſame Day, though the Church had in it two large Stoves, with good Fires, *of the common Conſtruction*, and has this Summer been incloſed by good Screen-doors, and though the Thermometer in the Street was up at 52, yet the Cold in the Church (to my own Feelings) was as great as I have felt it this Winter; the Walls and Pavement were wet all over, and the Marks of the Hand were left on the Pews, yet the Thermometer in the Church never roſe above 50 the whole Time.

The making Rooms too hot is the moſt to be dreaded of any Thing that can happen to theſe Stove-Grates: But this is ſo eaſily avoided, if the Uſers pay the leaſt Attention to the Principle, that it may be obviated in a few Minutes, by ſhutting out the warm Air, by opening the Cold-Air Channels, and by opening the Flaps in the Chimneys. (See Page 9.)

Directions for fixing the American Stove.

IF a Stove of this Kind is to be placed in a common Fire-Place, a Hole muſt be made through the Back of the Chimney, or through the Hearth, to communicate with the external freſh Air; and, this Hole ſhould be made as large as Circumſtances will admit, always obſerving to make the Hole deſcending, if poſſible, ſo that the outward Air may aſcend towards the Stove.

The hollow Baſe of the Stove muſt be placed againſt this Hole, ſo as to cover it completely; and the Bottom of the Baſe muſt be fitted ſo cloſe to the Hearth, and pointed with Lime or Putty, that the Air may not paſs: And Care muſt alſo be taken to confine the Baſe down to the Hearth ſo that it may not riſe or ſlide from its Place, at any Time, when the Stove is *laid down upon its Face* for more convenient cleaning or ſweeping. The eaſieſt Mode of lifting and ſetting up the Stove upon its Baſe, or of taking it down from thence, is previouſly to place, before the Baſe, a temporary Block or Step of equal Height with it, on which the Stove may be laid on its Face, with the bottom Edge of the Front directed to its proper Place on the Baſe; after which, by raiſing up the Head, ſo as to poiſe the Stove with the ſaid *bottom Edge of its Front*, bearing on *the Front of the Baſe*, it may be eaſily guided into the proper Grooves.

Then a few Feet of Iron Funnel muſt be put upon the Stove, to reach above the Breaſt of the Chimney; and the Chimney incloſed by Iron Plates, ſo conſtructed and placed in a ſquare or oblong Iron Frame, that they may be eaſily removed when the Chimney wants ſweeping.

When this is done, the warm Air, introduced by the Stove, will be carried into the Room, which otherwiſe (if the Chimney was not thus incloſed) would paſs up the Chimney and be loſt.

The Square of theſe ſaid Iron Frames ought always to be as large as the Chimneys will admit, as well for the more ſuddenly cooling the Room when too hot, as for the more convenient Paſſage of the Chimney-Sweeper; and ſhould be placed as low in the Chimney as conveniently may be without being ſeen.

The Points of the Frame muſt reſt in the Brick-Work or Side of the Chimney; and the outer Edge of it muſt be cloſely connected with the Wall all round by Lime and Tiles, in Form of a Hopper: After which, the two looſe Iron Plates, with ſemicircular Openings, will ſurround the Iron Funnel, ſo that the Whole of the warm Air ſhall flow into the Room: The Plates then may be eaſily taken down for cleaning every Morning, and be as eaſily replaced, having proper Handles for that Purpoſe.

But, if the Stove is to be fixed in a Room where there is no Chimney, it may be placed in any Part of it, where Communication may be had with the outward Air; and Nothing more is neceſſary than a ſufficient Length of Funnel to carry it through the Roof, or Wall, or Window, or into any other Chimney that may be convenient.

If the Fire-Place be too ſmall to receive the intended Stove, then the Chimney may be cloſed by the aforeſaid Frame and Plates, and the Stove may ſtand before the Fire-Place, as the Smoke may be carried off, by the Help of a circular Elbow, into the Chimney above the Mantle-piece, without the leaſt Inconvenience, and even with more Effect.

Reference to the PLATES.

The Stove, in the firſt Plate, is the Pattern now placed in *Drapers-Hall*, and St. *John's* Church, *Southwark:* The Pattern is very elegant, (as appears by the Print,) and fit for any Church, Hall, Library, or public Building; and the Carving may be varied at Pleaſure.

The Stoves in the ſecond Plate are the Firſt, Third, and Fifth, Size, of the plain Patterns I have already made.

The third Plate ſhews the ornamented Patterns of the five firſt Sizes with narrow Baſes, which have uſually been made. And,

The fourth Plate ſhews the different Kinds of oval and other Fronts that are now made, together with the Alteration that is made of increaſing the Width of the Baſe upon which they ſtand. The Reaſon of this is, that the Stove may ſtand upon the inner Edge of the Baſe, ſo that the Heat of the Fire may not injure the poliſhed or japanned Fronts that may be added to them, and which are now made to any Degree of Elegance.

The Holes for the Admiſſion of cold Air are now always made at the Side, (as is here deſcribed,) that, when the Room is too hot, the freſh Air may be introduced as cold as poſſible, by which Means the Room is more quickly made cool.

The right-hand Stove, marked 4, is the plain Stove of that Size; upon which either ſquare, oval, or poliſhed, Fronts, may be eaſily ſcrewed, or removed at Pleaſure. The other two are the oval and ſquare Fronts ſo applied to the ſame ſized Stove. The crooked Elbow of Iron or Copper is to ſhew how the Funnel may be carried through a Wall to any other Chimney, when there is no Fire-Place in the Room except the Grate itſelf.

The Holes and the Shutters, as they appear in the Print at the Side of the Stoves, are the Channel for the Introduction of warm Air. And,

The Holes, or Ventilators, near the Bottom, at the Front or Side of the Baſe, are the Channels for Introduction of cold Air, if the Room be too hot; when theſe are opened, the Channel for hot Air muſt be ſhut, and *vice verſa*.

ADVERTISEMENT.

A Good Paſſage to the cold Air is abſolutely neceſſary, otherwiſe this Grate will have but very little better Effect than any other Regiſter-Stove of the beſt Kind, whoſe Efficacy conſiſts only in contracting the Chimney, whereby Warmth is acquired by preventing the Exchange of Air: But, if a good Communication with the freſh Air is obtained, it is infinitely ſuperior in Effect to any other Principle hitherto diſcovered.

To obtain this Communication with cold Air is the only Difficulty that can happen; but it may be obtained many different Ways.

It may be brought upwards, by a proper Aperture through the Hearth, provided there be a cold Cellar or Paſſage underneath, where cold freſh Air (and no bad Smells) may come.

Or it may be brought directly through the Chimney-Back, if that is expoſed to the cold Air; or into any cold Staircaſe, or other open Place, where cold Air may come. Theſe are the beſt and readieſt Means.

But, if the Chimneys ſtand in the Middle of the Houſe, (which is too often the Caſe,) then the Air may be had by an Opening through the Hearth, made to communicate between the Flooring-Joiſts and the Cieling-Joiſts; this done, Nothing elſe is wanting but a Hole through the outſide Wall, on any Side of the Room, to communicate with the Space between the Flooring and Cieling Joiſts.

But, if there be no Cieling-Joiſts to the Room below, obſerve by the Boards which Way the Joiſts are laid; and, if they point to the Windows, front or ſide, it is well, becauſe a Paſſage may be then eaſily made under the Hearth or through the Jamb of the Chimney, to permit the Air to paſs between the Joiſts.

But, if that cannot be done,

Then a Hole may be made, under the Bottom of the back Part of the Stove, into the Room below, whether it be a Parlour, Kitchen, Cellar, or any other Place: And, in this Caſe, a wooden Trunk, or long Deal Box, may be fixed up to the Top of the Room below, which will have the Appearance of a Girder acroſs the Cieling, and which will convey the cold Air acroſs the Room to the Bottom of the Stove in the Room above.

If the Stove is placed in a Room upon a Ground-Floor, and the Ground at the Outſide of the Building is higher than the Floor, then an Area muſt be ſunk at the Outſide of the Wall, below the Hole made through the Wall, to take off the Wet.

And, in all the aforeſaid Caſes, proper Grates ſhould be placed againſt the outſide Wall, to prevent Birds or Vermin from getting in to produce any bad Smell that might affect the Air which ſupplies the Room.

Many of theſe Stoves have lately been put up for the expreſs Purpoſe of curing ſmoky Chimneys, and have always ſucceeded: For Chimneys generally ſmoke, either for *Want of Air*, or by having *too much*; in both theſe Caſes the Cure is effectual; for, though in ſome Situations the Wind will blow perpendicularly down the Chimney, yet, even in this worſt

Caſe, a common hooded-noſtril Pot, fixed on the Top of the Chimney where one of theſe Stoves is placed, will always inſure an effectual Cure.

Great Care ſhould be taken, by the Workmen, that all Crevices of Doors and Windows be ſtopped, and all the Doors well liſted; for, though the Stove will do very well without theſe Precautions, yet its Effect is improved, in a very increaſed Proportion, as other Inlets are ſtopped: For, when the Windows or Doors of a Room are kept open, the Influx of Air, through the Stove, is very ſmall; but, when the Windows and Doors are kept ſhut, the Air ruſhes briſkly through the Air-Box of the Stove; and, therefore, if all Crevices of Doors, Windows, &c. be well ſtopped, the Influx of warm or cold Air, through the Stove, will be ſo forcible as to raiſe or lower the Thermometer, almoſt to any Degree that may be required, with a very moderate Fire.

The Cracks in old wainſcoted Rooms ſhould be papered over and painted; the Joints, in old Caſements, Windows, and Saſhes, ſhould be ſtopped with Tow; and the Cracks in Floors ſhould be well caulked or puttied, or elſe the Boards new-laid, ſo that the whole Supply of warm or cold Air may be introduced, if poſſible, merely through the Stove, which will then have its fulleſt Effect.

The Purchaſers of theſe Stoves may have them properly fixed, by their own Workmen, under the Direction of Perſons acquainted with the Mechaniſm and neceſſary Conſtruction of them, who ſhall be ſent to any Part of England for that Purpoſe, provided due Allowance be made (by the Purchaſers) for their Attendance and Travelling-Expences.

Directions for the Houſe-Maid.

WHEN ſhe goes to light the Fire in the Morning, the firſt Thing which ought to be obſerved is that all the Air-channels in the Stove ſhould be carefully ſhut up, that the Duſt or Soot may not fall into theſe Channels; and the Flaps of the Chimney ſhould be taken out, whereby a Draught will be made to carry off all Duſt or Soot which would otherwiſe fly into the Room. Then, with a Hand-bruſh, ſhe ought carefully to ſweep down all Soot from the Chimney which is within her Reach. When the Stove is made very clean, the Fire kindled, and all Duſt or Dirt of every Kind taken away, the Flaps muſt be put up again into the Chimney; and, as ſoon as the Stove is warm, the warm-air Shutters may again be opened.

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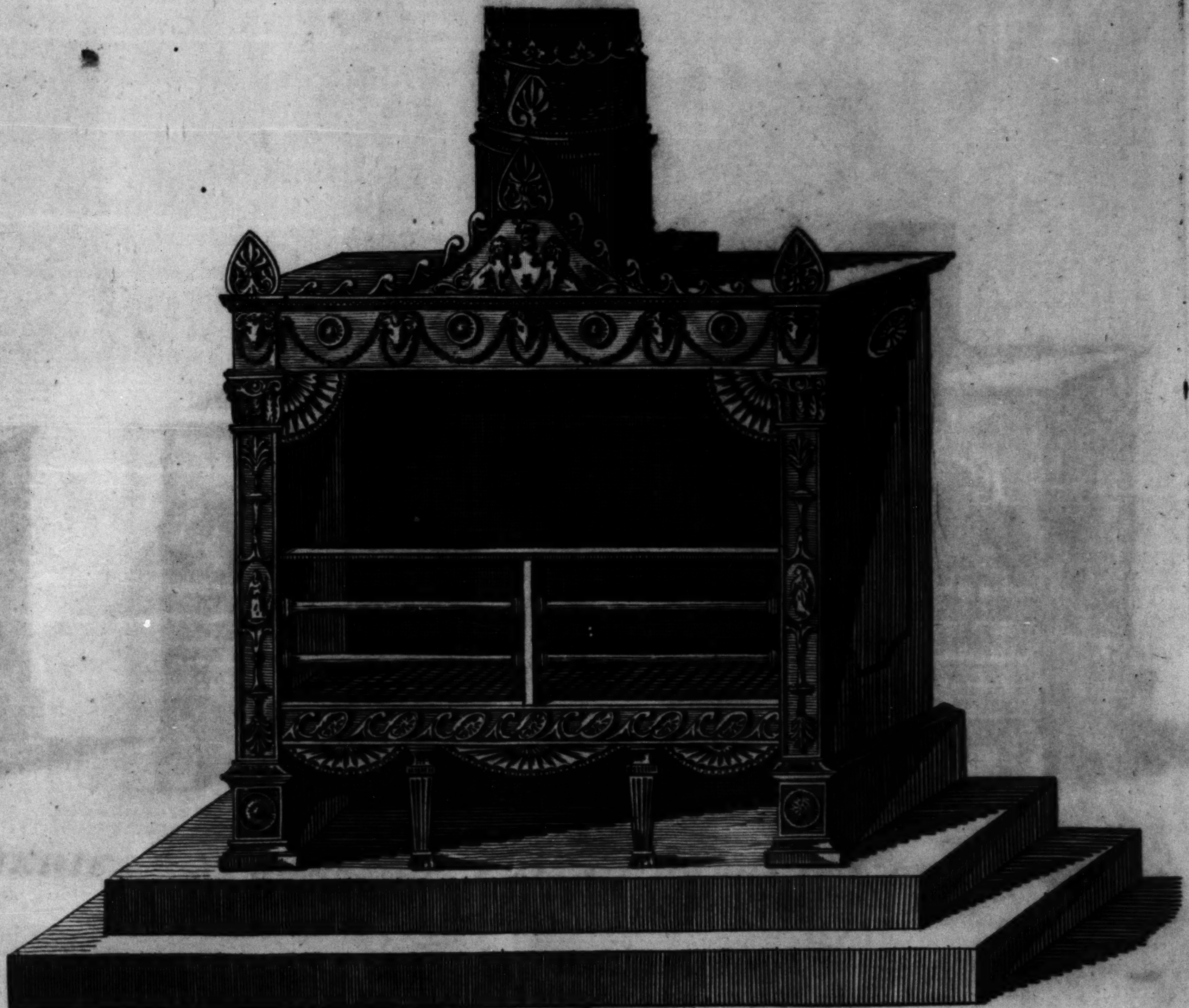

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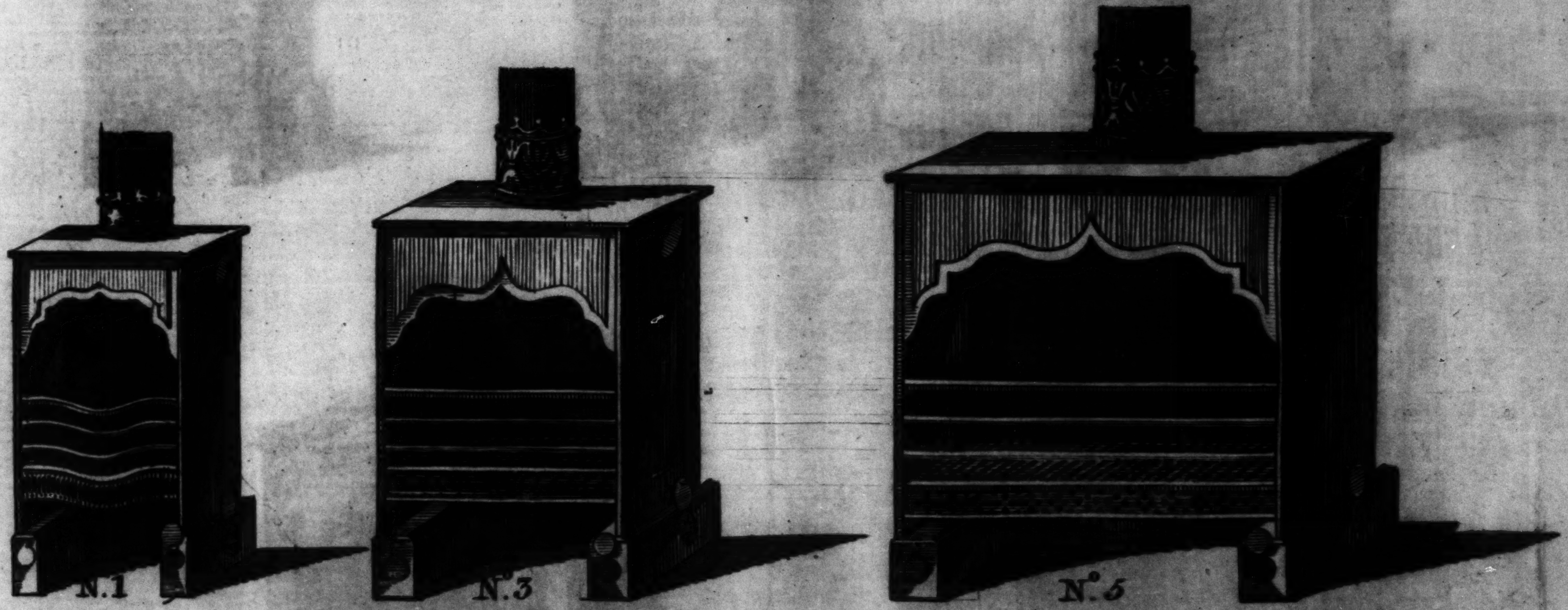

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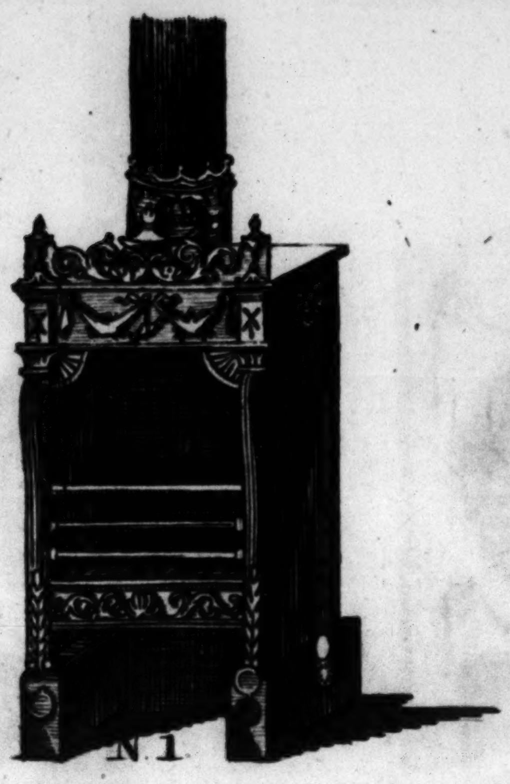
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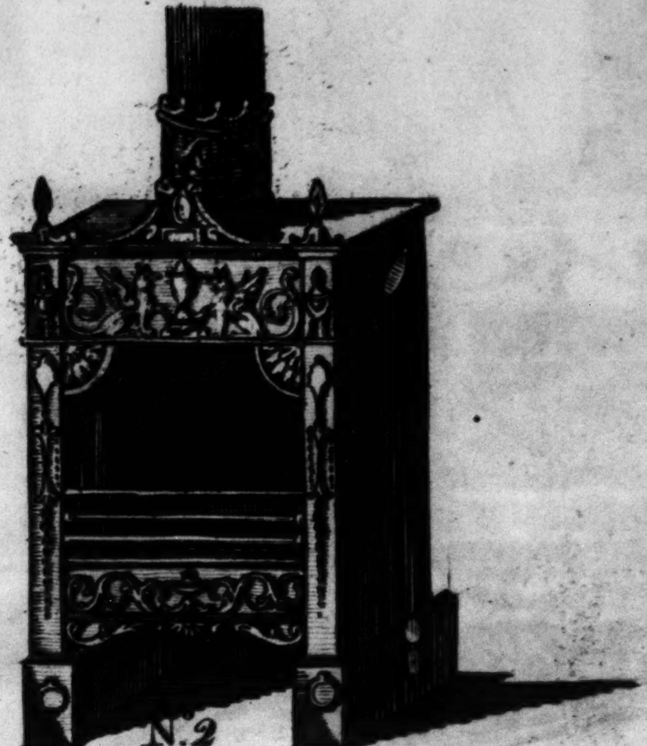
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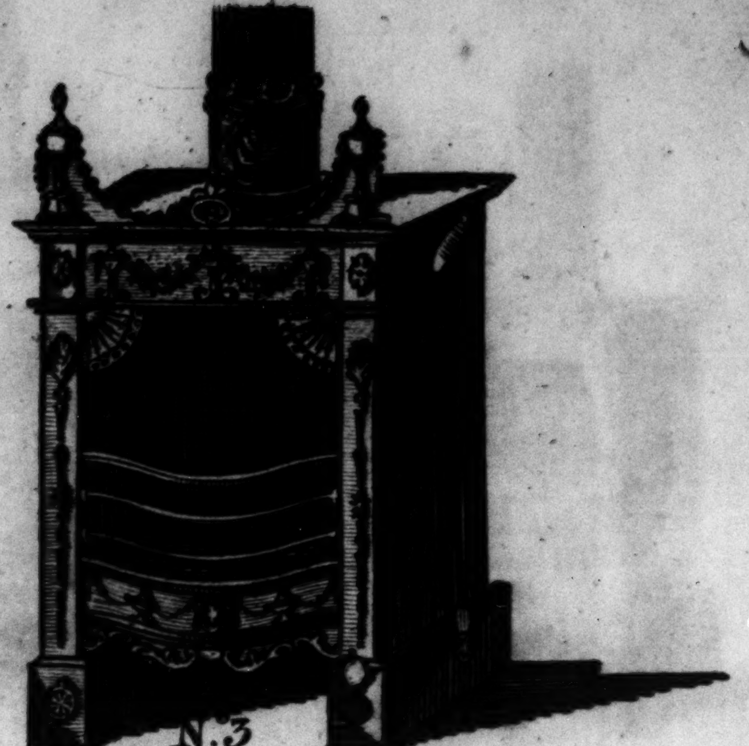
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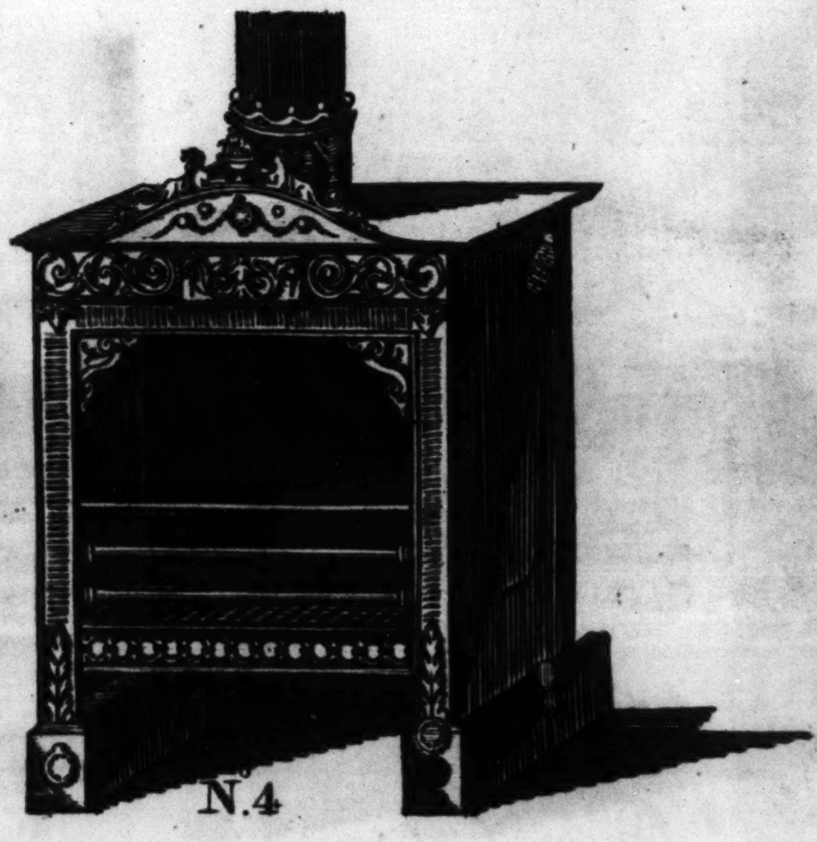
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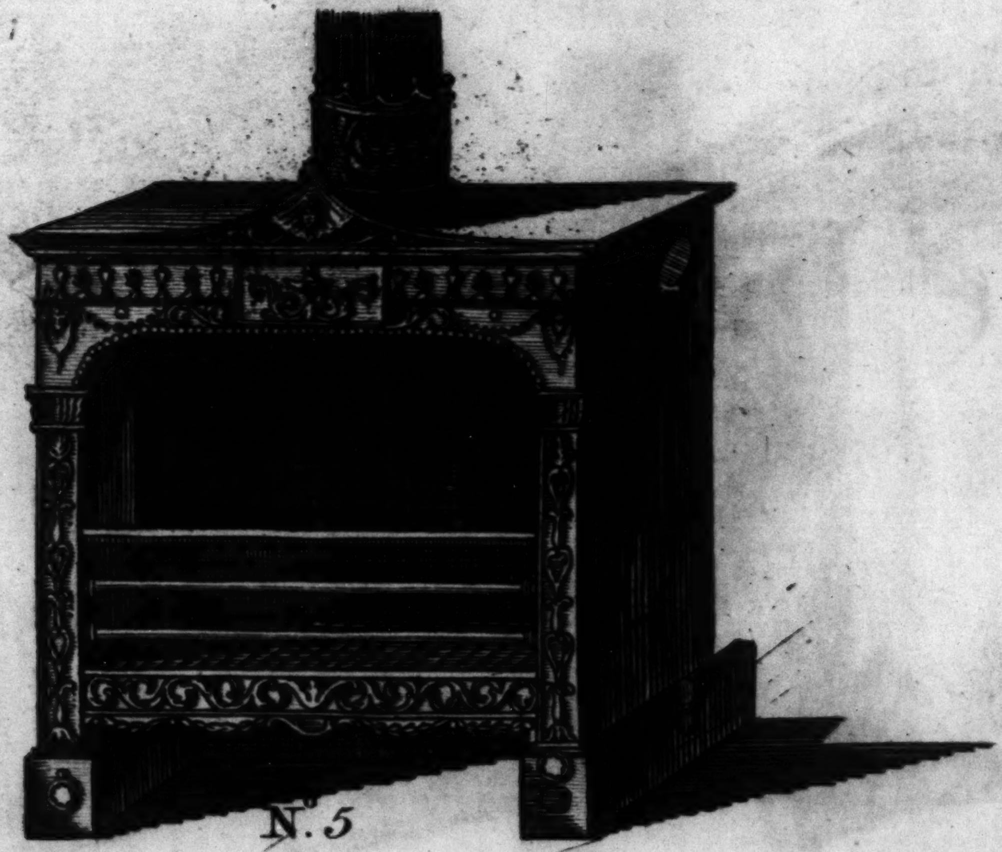
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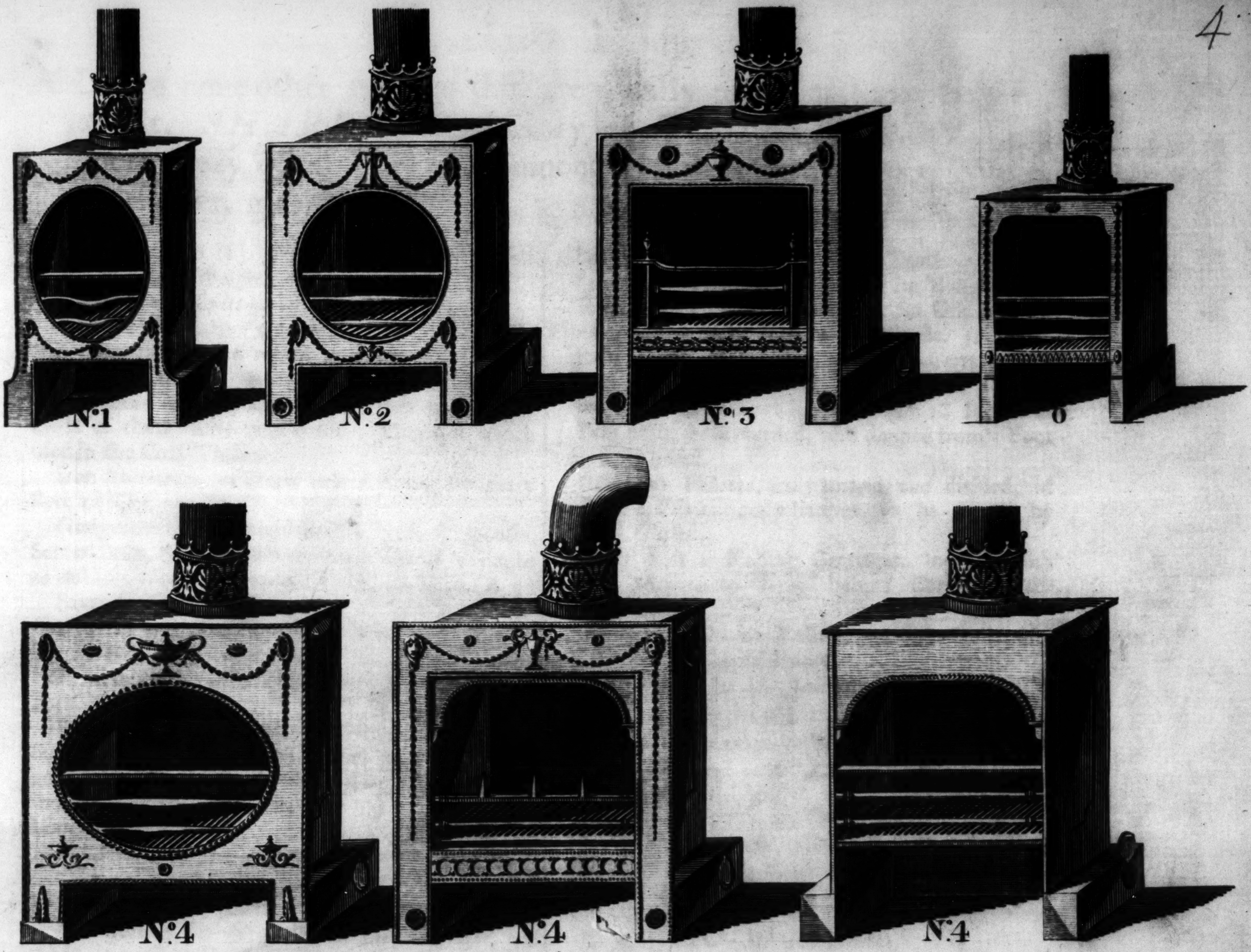

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A Liſt of ſome other Articles that are uſually made, and may be ſeen, at Mr. *SHARP*'s Manufactory in TOOLEY-STREET; and where every other Sort of Ironmongery, Braſs, or Copper, Ware, whatſoever, may be had.

ANCHORS (S) of every Size, from a Half Hundred Weight to 40, 50, or 60, *Cwt.*

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A Ship's Windlaſs, of a particular Conſtruction, (B) (by Capt. *Stephen Wright*, of *North-Shields*): It ſtops the Cable at every Inch, is perfectly ſafe, and has been ſo much approved of, that many Hundreds of them have been made. They are much uſed in the Coal-Trade.

Iron Axle-trees, or Screw bolted Arms, for every Sort of Carriage.

Gudgeons (T), Caſes and Braſſes, Steps, Cappooſes, Screw-Bolts, Hoops, and every other Sort of wrought or caſt Iron Work, truly turned, for Sugar-Mills. (A, E)

Several particular Patterns of Iron Windmill-Shafts, for reducing Friction, with Iron Croſſes for the Fans, &c. which have been much approved; alſo Timber-Work, if required, fitted to every Part of the Mill.

Screwed Bolts and Nuts of every Diameter, for Sugar-Mill Work, the ſame being cut in the Mill, and without Heads, ſo that they may eaſily be ſhortened or lengthened by the Uſers to whatever Length they want.

Beſides the ſeveral Kinds of Rolling Carriages mentioned in my Book of Prints, every Sort of Wains, Waggons, Carts, &c. either broad or narrow wheeled, for Weſt-India Planters Uſe, are made, as well as Trucks particularly conſtructed for Sugar-Hogſheads.

Several Sorts of Street or Porter Trucks.

Several Sorts of Rolling Trucks for Warehouſes.

Several Sorts of Tumbril-Carts, for One or Two Horſes, from 9 to 12 Inch broad Wheels. (K)

Bottle-Carts, Fiſh-Carts, Baggage-Carts or Caravans, on Springs or Braces.

Several Sorts of Cart-Rollers, from 18 Inches to 3 Feet high, truly turned, and divided from 1 Foot to 7 Feet broad.

Caſt Iron Rollers, truly turned and divided, of any Size or Dimenſions whatever, to be drawn by Men or Horſes.

Every Sort of Rolling Carriages, together with Rollers adapted to hang behind Carts, &c. for Graſs-Rolling.

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Ploughs of every Kind.

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Cambridge.
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Welch.
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Carriage-Ploughs, entirely of Iron.

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Improvement on ditto by Rack and Pinion.

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Drill-Ploughs of ſeveral Sorts.

Horſe-Hoes of ſeveral Sorts.

Drill-Plough by Ducket, for Broad-caſt Sowing. (M)

Man-Hoe by Ducket, to be drawn by Men, and fitted to the broad-caſt Plough. (N)

Horſe-Shovels for Ant-hills.

Horſe-Shovels for removing Earth to ſhort Diſtances (I), and for levelling uneven Ground. Theſe are remarkably expeditious Machines; they load themſelves, carry the Load, and deliver it where wanted; and the Horſes proceed forwards and back again for a new Load, without ever ſtopping either to load or unload.

Navigation-Wheelbarrows (G), Brindley's Pattern.

Caſt Iron Wheels for Wheelbarrows.

Truck-Wheels, &c. made very light, and bound with wrought Iron to make them ſtronger and increaſe the Breadth.

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Screw-Jacks, double and ſingle, and of ſeveral Sizes.

Screw-Jacks, a particular Pattern, for Carriages. (R)

Iron Blocks with Braſs Sheaves, ſeveral Kinds.

Combination ditto, Smeaton's Pattern. (C)

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Blaſting Tools, in Sets, for Mines, Quarries, *&c.*

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Cranes of various Conſtructions.

Weighing-Engines, portable, for weighing great Weights, Horſes, Cattle, Waggons, *&c.* (H)

Horſe-Rakes for various Purpoſes. (O)

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Steel and Quern-ſtone Mills of many Kinds.

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Stoves *for the Introduction of warmed Air*, (not only of the Kind already deſcribed as *American* Stoves,) but alſo upon the Principle of an inverted Syphon, ſuch as are erected in the Foundling-Hoſpital, Bank, *&c.*

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Square ditto and Boxes, made from Plank.

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Together with ſeveral other uſeful Things in rough Mechaniſm.

Moſt of the Articles above-mentioned are fully deſcribed in my Book of Prints and Deſcriptions already publiſhed.

N. B. Horſes are conſtantly ready, at the Manufactory, to ſhew the Effects of the ſeveral Rakes, Ploughs, Shovels, *&c.* or to draw the different Sorts of Carts, Waggons, or Rollers, whereby Judgement may be formed of the Utility of each Machine. The loweſt Price is fixed upon each Article, and Payment will be expected on Delivery of the Goods.

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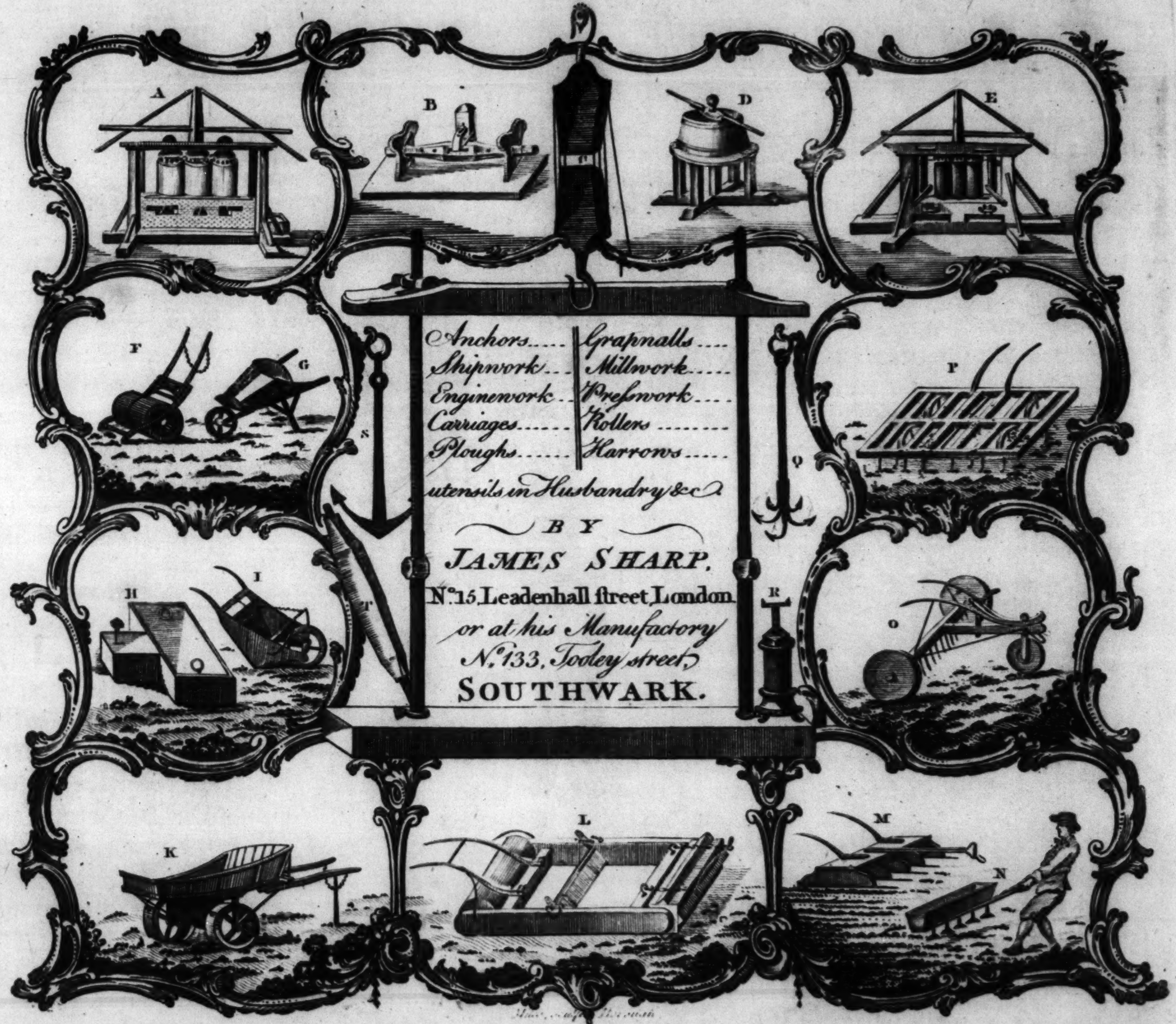

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